REMARKS

This paper is responsive to a Non-Final Office action dated March 14, 2006. Claims 1-35 were examined. A non-narrowing amendment has been made to claim 25 to remove limitations. New claim 36 has been added, which recites the limitations removed from claim 25. Non-narrowing amendments have been made to claims 1, 4, and 6 so that the claims recite a "[a] method comprising."

Drawings

The Office has not indicated whether the drawings are accepted or objected to by the Examiner. Applicant respectfully requests such indication.

Claim Rejections – 35 U.S.C. §101

Claims 1-19 are rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. Applicant traverses these rejections.

The burden is on the Office to set forth a *prima facie* case of unpatentability, requiring the Office to explain why the claims fall outside all of the statutory subject matter categories. The Office has done nothing more than paraphrase the claims, and characterize the paraphrased claims as being directed to abstract operations. The Office then concludes that the abstract operations do not product any tangible result, without any explanation.

Applicant respectfully submits that the claims fall into one of the subject matter categories expressly enumerated in 35 U.S.C. §101, which states

```
Whoever invents or discovers any new and useful process…may
obtain a patent therefor, subject to the conditions and
requirements of this title.
```

The courts have repeatedly emphasized the expansive language of this statute with the exception that a process claim directed to nothing more than abstract ideas, such as mathematical algorithms, natural phenomena, and laws of nature are not eligible for patent protection. The judicially created exception to §101, however, is also tempered as evidenced by patent protection being allowed for a practical application of an abstract idea (a mathematical algorithm, formula,

- 10 -

calculation) because it produced a useful, concrete, and tangible result (transforming data to produce a smoothed waveform). *See* In re Alapatt, 33 F.3d 1526 (Fed. Cir. 1994).

None of the claims 1 – 19 can reasonably be characterized as directed to nothing more than abstract ideas, natural phenomena, or natural laws. The claims are not directed to a mathematical algorithm, a formula, or a calculation. The claims variously recite substituting a lesser width register specified in a consumer instruction with a greater width register specifier or substituting a greater width consumer instruction with a plurality of instructions. The Office has not and cannot explain how the substituting is a mathematical algorithm, formula, or calculation.

Even if the claims 1 – 19 can somehow be characterized as being directed to an abstract operation, the claims cannot reasonably be characterized as not producing a useful, concrete, and tangible result, since either a modified or new instruction is produced. In addition, characterization of claims 1 – 19 by the Office as abstract and not producing a tangible result cannot be reconciled against case law, such as In re Alappat. Applicant respectfully requests withdrawal of the rejections, because the claims are not directed only to abstract operations. In addition, the claims, when performed, result in either a new instruction or a modified instruction, which is a useful, concrete, tangible result.

Claim Rejections – 35 U.S.C. §102

Claims 1-4, 6, 8, 9, 15, 16, 17, 20, 22, 23, and 31 are rejected under 35 U.S.C. §102(b) as being anticipated by Kahle, U.S. Patent No. 5,732,005 (hereafter, "Kahle"). Applicant respectfully traverses the rejections.

Emulating a double precision register vs. Substituting register specifiers in an instruction

The Office has substantially mischaracterized Kahle. Kahle discloses emulating a double precision register by storing double precision operands at a memory location and mapping the memory location to a single precision register. *See* col. 5, line 52 – col. 6, line 22. Special purpose registers are set to indicate whether a corresponding single precision register contains an integer operand, contains a single precision operand, is mapped to an emulated double precision register, or is invalid. *See* col. 4, line 31 – col. 5, line 3. Kahle never discloses or suggests

- 11 -

substituting a greater width register specifier for a lesser width register specified in a lesser width consumer instruction if the lesser width consumer instruction has a dependency with a greater width producer instruction as variously recited in independent claims 1, 6, 15, and 20. Kahle also fails to disclose or suggest substituting plural instructions for a greater width consumer instruction if a dependency exists between the greater width consumer instruction and a lesser width producer instruction as variously recited in claims 4, 23, and 31.

Applicant respectfully requests withdrawal of the rejections of independent claims 1, 4, 6, 15, 20, 23, and 31 at least because Kahle fails to disclose or suggest any of the limitations recited by the claims. Therefore, the independent claims 1, 4, 6, 15, 20, 23, and 31 are at least allowable over Kahle. In addition, Kahle fails to disclose or suggest any of the limitations of the claims depending from corresponding ones of the allowable independent claims.

Claim Rejections – 35 U.S.C. §103

Kahle

Claims 5, 7, 10, 18, 19, 21, 14, 32, 33, 34, and 35 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kahle. As stated above, the Office has mischaracterized Kahle. Claim 18 recites a "method of **handling a register conflict** between a first instruction specifying a lesser width destination register and a second instruction specifying a greater width source register, the method comprising **substituting plural instructions for the second instruction**...." Kahle does not disclose or suggest handling a register conflict. Kahle discloses accommodating a double precision operand at a memory location that is mapped to a single precision register. Kahle does not disclose or suggest substituting plural instructions for an instruction that specifies a greater width register.

Claim 18 also recites "**a first substitute instruction to merge plural lesser width registers aliased onto the source register** specified by the second instruction into a temporary register... and a second substitute instruction to perform the operation specified by the second instruction using the temporary register as a source register." Similar recitations are made in claims 5, 10, 19, 24, and 33. The Office reasons that it would have been obvious to perform the limitations of these claims because the Office assumes that Kahle discloses merging single

- 12 -

precision registers that are mapped to act as double precision registers. Again, the Office

misinterprets Kahle. Kahle does not disclose or suggest merging single precision registers. One

single precision register is mapped to a memory location that emulates a double precision

register. The merging of registers suggested by the Office has no basis in Kahle and most likely

conflicts with Kahle. The Office goes in making erroneous assumption for each of the dependent

claims. Applicant respectfully submits that none of the claims are obvious in view of Kahle, and

respectfully requests withdrawal of the rejections.

Yeager and Kahle

Claims 11, 12, 13, and 14 are rejected under 35 U.S.C. §103(a) as being unpatentable

over Kahle as applied to claims 1-10 above, and further in view of Yeager, U.S. Patent No.

6,216,200 (hereafter, "Yeager"). Claims 25-30 are rejected under 35 U.S.C. §103(a) as being

unpatentable over Yeager in view of Kahle. These rejections rely on the erroneous assumptions

described above as to the disclosure of Kahle. Applicant respectfully traverses these rejections

for at least the reasons above regarding Kahle. Furthermore, the Office also relies on a mistaken

understanding of Yeager. The Office relies merely on Yeager's disclosure of instructions and

masks. Yeager discloses masks to identify instructions as either read or write instructions and

masks to identify age of instructions. Yeager does not disclose or suggest a first register mask

that identifies **registers to be modified by lesser width instructions active in a pipeline** nor a

second register mask that identifies **registers to be modified by greater width instructions

active in a pipeline** as recited in claims 11 and 36.

With regard to the rejection of independent claim 25, the Office repeats

mischaracterization of Kahle by stating that "Kahle teachings of dependency between single and

double precision instructions" and by stating that Kahle and Yeager are both "directed toward the

processing of instructions that may be independent on other instructions." **As stated above,

these statements are seriously flawed and find no support from the references.** Neither

Kahle nor Yeager, standing alone or in combination, disclose or suggest "logic to substitute a

greater width source register specifier for a lesser width source register specifier if a dependency

exists between a greater width producer instruction and a lesser width consumer instruction…and

- 13 -

logic to substitute plural instructions for a greater width consumer instruction if a dependency exists between a lesser width producer instruction and a greater width consumer instruction."

Applicant does not iterate through the rejections of each of the dependent claims, because it should be ***abundantly clear*** that Kahle's disclosure of mapping a memory location to a single precision register nor Yeager's disclosure of an address queue, standing alone or in combination, *clearly* do not disclose or suggest any of the claims.

In summary, claims 1-36 are in the case. All claims are believed to be allowable over the art of record, and a Notice of Allowance to that effect is respectfully solicited. Nonetheless, if any issues remain that could be more efficiently handled by telephone, the Examiner is requested to call the undersigned at the number listed below.
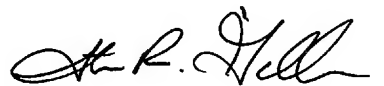
Respectfully submitted,

Steven R. Gilliam, Reg. No. 51,734
Attorney for Applicant(s)
(512) 338-6320 (direct)
(512) 338-6300 (main)
(512) 338-6301 (fax)